

## Complete Summary

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### GUIDELINE TITLE

Medical management of adults with hypertension.

### BIBLIOGRAPHIC SOURCE(S)

Michigan Quality Improvement Consortium. Medical management of adults with hypertension. Southfield (MI): Michigan Quality Improvement Consortium; 2007 Aug. 1 p.

### GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previous version: Michigan Quality Improvement Consortium. Medical management of adults with hypertension. Southfield (MI): Michigan Quality Improvement Consortium; 2005 Aug. 1 p.

## COMPLETE SUMMARY CONTENT

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## SCOPE

### DISEASE/CONDITION(S)

Hypertension

### GUIDELINE CATEGORY

Evaluation  
Management  
Treatment

### CLINICAL SPECIALTY

Cardiology  
Family Practice  
Internal Medicine

## **INTENDED USERS**

Advanced Practice Nurses  
Health Plans  
Physician Assistants  
Physicians

## **GUIDELINE OBJECTIVE(S)**

- To achieve significant, measurable improvements in the management of hypertension through the development and implementation of common evidence-based clinical practice guidelines
- To design concise guidelines that are focused on key management components of essential hypertension to improve outcomes

## **TARGET POPULATION**

Adult patients  $\geq 18$  years of age who are:

- Not pregnant
- Diagnosed with hypertension
  - Prehypertension (120-139/80-89)
  - Hypertension:
    - Stage 1 (140-159/90-99)
    - Stage 2 ( $\geq 160/\geq 100$ )

## **INTERVENTIONS AND PRACTICES CONSIDERED**

### **Evaluation**

1. Assessment of lifestyle, cardiovascular risk factors, concomitant disorders, causes of hypertension, target organ damage, and cardiovascular disease
2. Physical examination including 2 or more blood pressure (BP) measurements using regularly calibrated equipment with appropriate sized cuff and separated by at least 2 minutes, verification in contralateral arm, funduscopic exam, neck exam (bruits), heart and lung exam, abdominal exam for bruits or aortic aneurysm, and extremity pulses
3. Laboratory tests including potassium, creatinine, glucose, hematocrit, calcium, urinalysis, lipid panel, and electrocardiogram (EKG)

### **Management/Treatment**

1. Patient education and nonpharmacologic interventions including lifestyle modifications and self BP monitoring
2. Pharmacologic intervention including
  - Thiazide-type diuretics

- Two-drug combination (thiazide-type diuretic plus angiotensin-converting enzyme inhibitor [ACEI], beta blocker or calcium channel blocker [extended/sustained release or long acting])
  - Angiotensin receptor blocker (ARB) if angiotensin converting enzyme inhibitor not tolerated
3. Post therapy BP monitoring and adjustment of therapy

## **MAJOR OUTCOMES CONSIDERED**

Not stated

## **METHODOLOGY**

### **METHODS USED TO COLLECT/SELECT EVIDENCE**

Searches of Electronic Databases

### **DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE**

The Michigan Quality Improvement Consortium (MQIC) project leader conducts a search of current literature in support of the guideline topic. Computer database searches are used to identify published studies, existing protocols and/or national guidelines on the selected topic developed by organizations such as the American Diabetes Association, American Heart Association, American Academy of Pediatrics, etc. If available, clinical practice guidelines from participating MQIC health plans and Michigan health systems are also used to develop a framework for the new guideline.

### **NUMBER OF SOURCE DOCUMENTS**

Not stated

### **METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE**

Weighting According to a Rating Scheme (Scheme Given)

### **RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE**

#### **Levels of Evidence for the Most Significant Recommendations**

- A. Randomized controlled trials
- B. Controlled trials, no randomization
- C. Observational studies
- D. Opinion of expert panel

### **METHODS USED TO ANALYZE THE EVIDENCE**

Review

## **DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE**

Not stated

## **METHODS USED TO FORMULATE THE RECOMMENDATIONS**

Expert Consensus

## **DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS**

Using information obtained from literature searches and available health plan guidelines on the designated topic, the Michigan Quality Improvement Consortium (MQIC) project leader prepares a draft guideline to be reviewed by the medical directors' committee at one of their scheduled meetings. Priority is given to recommendations with [A] and [B] levels of evidence (see "Rating Scheme for the Strength of the Evidence" field).

The initial draft guideline is reviewed, evaluated, and revised by the committee resulting in draft two of the guideline. Additionally, the Michigan Academy of Family Physicians participates in guideline development at the onset of the process and throughout the guideline development procedure. The MQIC guideline feedback form and draft two of the guideline are distributed to the medical directors, as well as the MQIC measurement and implementation group members, for review and comments. Feedback from members is collected by the MQIC project leader and prepared for review by the medical directors' committee at their next scheduled meeting. The review, evaluation, and revision process with several iterations of the guideline may be repeated over several meetings before consensus is reached on a final draft guideline.

## **RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS**

Not applicable

## **COST ANALYSIS**

A formal cost analysis was not performed and published cost analyses were not reviewed.

## **METHOD OF GUIDELINE VALIDATION**

External Peer Review  
Internal Peer Review

## **DESCRIPTION OF METHOD OF GUIDELINE VALIDATION**

When consensus is reached on the final draft guideline, the medical directors approve the guideline for external distribution to practitioners with review and comments requested via the Michigan Quality Improvement Consortium (MQIC) health plans (project leader distributes final draft to medical directors' committee, measurement and implementation groups to solicit feedback).

The MQIC project leader also forwards the approved guideline draft to appropriate state medical specialty societies for their input. After all feedback is received from external reviews, it is presented for discussion at the next scheduled committee meeting. Based on feedback, subsequent guideline review, evaluation, and revision may be required prior to final guideline approval.

The MQIC Medical Directors approved this updated guideline in August 2007.

## RECOMMENDATIONS

### MAJOR RECOMMENDATIONS

The level of evidence grades (A-D) are provided for the most significant recommendations and are defined at the end of the "Major Recommendations" field.

#### Initial Assessment

- The objectives of the initial evaluation are to assess lifestyle, cardiovascular risk factors, and concomitant disorders, reveal identifiable causes of hypertension, and check for target organ damage and cardiovascular disease.
- Physical examination: 2 or more blood pressure (BP) measurements using regularly calibrated equipment with the appropriate sized cuff and separated by at least 2 minutes, verification in contralateral arm, funduscopic exam, neck exam (bruits), heart and lung exam, abdominal exam for bruits or aortic aneurysm, and extremity pulses **[A]**
- Laboratory tests prior to initiating therapy: potassium, creatinine, glucose, hematocrit, calcium, urinalysis, lipid panel, and electrocardiogram (EKG) **[D]**

#### Patient Education and Nonpharmacologic Interventions

- Lifestyle modification: weight reduction (body mass index [BMI] goal <25), reduction of dietary sodium to less than 2.4 g/day, DASH diet **[A]** (i.e., diet high in fruits and vegetables, reduced saturated and total fat), aerobic physical activity  $\geq 30$  minutes most days of the week, tobacco avoidance, increased dietary potassium and calcium, moderation of alcohol consumption<sup>1</sup> **[A]**
- Use of self BP monitoring. Home measurement device should be checked regularly for accuracy. Mean self measured BP >135/85 is generally considered to be hypertensive

<sup>1</sup>Moderate alcohol consumption is defined as up to two drinks per day for men, one drink per day for women and older people.

#### Goals of Therapy

- Adjust therapy to achieve target BP  $\leq 140/90$  (<130/80 for patients with diabetes or kidney disease)

#### Pharmacologic Interventions

- Prehypertension (120-139/80-89): none unless compelling indication (e.g., diabetes, renal failure, congestive heart failure [CHF], post-myocardial infarction [MI], stroke, arteriosclerotic cardiovascular disease)
- Hypertension, Stage 1 (140-159/90-99): thiazide-type diuretics alone or in combination with angiotensin-converting enzyme inhibitor (ACEI), beta blocker, or calcium channel blocker (extended/sustained release or long acting)<sup>2</sup>. Angiotensin receptor blocker (ARB) if ACEI not tolerated
- Hypertension, Stage 2 ( $\geq 160/\geq 100$ ): two-drug combination (thiazide-type diuretic plus ACEI, beta blocker, or calcium channel blocker [extended/sustained release or long acting]<sup>2</sup>; use ARB if ACEI not tolerated)
- ACEI (ARB if ACEI not tolerated) are recommended in patients with diabetes or heart failure **[A]**.
- Beta-blockers are recommended in patients with ischemic heart disease or heart failure.
- 3 or more drugs may be necessary for some patients to achieve goal BP.

<sup>2</sup>Avoid use of short-acting nonsustained release calcium channel blockers **[A]**.

### **Monitoring and Adjustment of Therapy [D]**

- Prehypertension without medication: annual BP check with lifestyle modification counseling
- Hypertension, Stage 1: initiate therapy and recheck at monthly intervals until goal is reached.
- Hypertension, Stage 2: initiate therapy and recheck weekly or more often if indicated. Symptomatic Stage 2 may require hospital monitoring and treatment.
- Modify antihypertensive therapy as needed if adverse effects become intolerable
- Once BP controlled with medication: recheck every 3 to 6 months.
- Serum potassium and creatinine should be monitored at least 1 to 2 times/year for patients on medication.

### **Definitions:**

### **Levels of Evidence for the Most Significant Recommendations**

- A. Randomized controlled trials
- B. Controlled trials, no randomization
- C. Observational studies
- D. Opinion of expert panel

### **CLINICAL ALGORITHM(S)**

None provided

## **EVIDENCE SUPPORTING THE RECOMMENDATIONS**

### **TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS**

The type of evidence is provided for the most significant recommendations (See "Major Recommendations" field).

The guideline is based on several sources including, Hypertension Diagnosis and Treatment, Institute for Clinical Systems Improvement, 2006 ([www.icsi.org](http://www.icsi.org)).

## **BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS**

### **POTENTIAL BENEFITS**

Through a collaborative approach to developing and implementing common clinical practice guidelines and performance measures for hypertension, Michigan health plans will achieve consistent delivery of evidence-based services and better health outcomes. This approach also will augment the practice environment for physicians by reducing the administrative burdens imposed by compliance with diverse health plan guidelines and associated requirements.

### **POTENTIAL HARMS**

- Adverse effects of antihypertensive medications
- The use of short-acting nonsustained release calcium channel blockers should be avoided in patients with stage 1 and 2 hypertension.

## **QUALIFYING STATEMENTS**

### **QUALIFYING STATEMENTS**

This guideline lists core management steps. Individual patient considerations and advances in medical science may supersede or modify these recommendations.

## **IMPLEMENTATION OF THE GUIDELINE**

### **DESCRIPTION OF IMPLEMENTATION STRATEGY**

Approved Michigan Quality Improvement Consortium (MQIC) guidelines are disseminated through email, U.S. mail, and websites.

The MQIC project leader prepares approved guidelines for distribution. Portable Document Format (PDF) versions of the guidelines are used for distribution.

The MQIC project leader distributes approved guidelines to MQIC membership via email.

The MQIC project leader submits request to website vendor to post approved guidelines to MQIC website ([www.mqic.org](http://www.mqic.org)).

The MQIC project leader completes a statewide mailing of the comprehensive set of approved guidelines and educational tools annually. The guidelines and tools

are distributed in February of each year to physicians in the following medical specialties:

- Family Practice
- General Practice
- Internal Medicine
- Other Specialists for which the guideline is applicable (e.g. endocrinologists, allergists, pediatricians, cardiologists, etc.)

The statewide mailing list is derived from the Blue Cross Blue Shield of Michigan (BCBSM) provider database. Approximately 95% of the state's M.D.'s and 96% of the state's D.O.'s are included in the database.

The MQIC project leader submits request to the National Guideline Clearinghouse (NGC) to post approved guidelines to NGC website ([www.guideline.gov](http://www.guideline.gov)).

## **INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES**

### **IOM CARE NEED**

Getting Better  
Living with Illness

### **IOM DOMAIN**

Effectiveness  
Patient-centeredness

## **IDENTIFYING INFORMATION AND AVAILABILITY**

### **BIBLIOGRAPHIC SOURCE(S)**

Michigan Quality Improvement Consortium. Medical management of adults with hypertension. Southfield (MI): Michigan Quality Improvement Consortium; 2007 Aug. 1 p.

### **ADAPTATION**

The guideline is based on several sources including, Hypertension Diagnosis and Treatment, Institute for Clinical Systems Improvement, 2006 ([www.icsi.org](http://www.icsi.org)).

### **DATE RELEASED**

2003 Aug (revised 2007 Aug)

### **GUIDELINE DEVELOPER(S)**

Michigan Quality Improvement Consortium - Professional Association

**SOURCE(S) OF FUNDING**

Michigan Quality Improvement Consortium

**GUIDELINE COMMITTEE**

Michigan Quality Improvement Consortium Medical Director's Committee

**COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE**

Physician representatives from participating Michigan Quality Improvement Consortium health plans, Michigan State Medical Society, Michigan Osteopathic Association, Michigan Association of Health Plans, Michigan Department of Community Health, and Michigan Peer Review Organization

**FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST**

Standard disclosure is requested from all individuals participating in the Michigan Quality Improvement Consortium (MQIC) guideline development process, including those parties who are solicited for guideline feedback (e.g. health plans, medical specialty societies). Additionally, members of the MQIC Medical Directors' Committee are asked to disclose all commercial relationships.

**GUIDELINE STATUS**

This is the current release of the guideline.

This guideline updates a previous version: Michigan Quality Improvement Consortium. Medical management of adults with hypertension. Southfield (MI): Michigan Quality Improvement Consortium; 2005 Aug. 1 p.

**GUIDELINE AVAILABILITY**

Electronic copies: Available in Portable Document Format (PDF) from the [Michigan Quality Improvement Consortium Web site](#).

**AVAILABILITY OF COMPANION DOCUMENTS**

None available

**PATIENT RESOURCES**

None available

**NGC STATUS**

This NGC summary was completed by ECRI on April 14, 2004. The information was verified by the guideline developer on July 27, 2004. This NGC summary was updated by ECRI on November 28, 2005. The updated information was verified by the guideline developer on December 19, 2005. This NGC summary was updated

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